



# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in Lids for Vessel Mouths

I, PAUL STEDLITZ VAN BAARN, a citizen of the United States of America, of 69th Street and Madison Avenue, New York 21, New York, United States of America (formerly of Hotel Lutetia, 43, Boulevard Raspail, Paris, France), do hereby declare this invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to lids and like closure devices for closing the mouths of vessels—for example, bottles and jars—and has for an object to provide a simple and efficient construction whereby the lid is initially secured in place by a breakable seal, but after the seal has been broken, is retained on the vessel in the manner of a hinged lid which can be replaced after some of the contents have been removed so as to reclose the vessel in at least substantially air-tight fashion.

According to the invention, a closure device comprises a skirted cover or lid formed from a single piece of moulded plastic which is elastic, such as polyethylene, polystyrene, or a polyvinyl resin such as polyvinyl chloride. The skirt may be stretched cold, when applied to a vessel or container, so as to grip the neck or mouth of the latter resiliently; or, because of the increased plasticity of the material of the closure device when hot, the device may be heated and then allowed to shrink onto the vessel so as to grip the latter elastically when the plastic material reaches room temperature.

A tear strip is adapted to be torn away when it is desired to open the vessel, this tear strip when removed partially separating the skirt portion of the closure device peripherally into interconnected upper and lower parts, the upper part constituting a shallow peripheral wall or flange around the lid or cover which is adapted to be raised when the vessel is opened, whilst the lower skirt part constitutes an anchoring band resiliently gripping the vessel to retain the lid thereon by means of the interconnection remaining between the upper and lower skirt parts and forming a

hinge.

The tear strip can take the form, for example, of a relatively strong wire embedded within the wall of the skirt during moulding of the latter.

An abutment on the cover or lid may engage a part of the vessel when the lid is open so as to releasably hold it open until the user positively recloses it. This abutment may conveniently be combined with the aforesaid hinge which interconnects the upper and lower skirt parts, and may comprise an elongated thicker portion projecting beyond the bottom edge of the skirt portion of the closure device, and the part of this thicker portion which projects beyond the edge of the skirt portion is capable of being turned to an inverted position so as to underlie the flexible anchoring band formed when the tear strip is removed, and in this way the projecting portion of the hinge maintains the lid in its open position and forms the abutment referred to above.

Closure devices according to the present invention and vessels or containers used therein can have any desired configuration of mouth, such as circular, oval, polygonal, etc., and the closure device itself can be provided with any type of sealing structure which may be known per se. For example, the lid may be provided with a plug adapted to enter into the mouth of a container so as to close it in a fluid-tight manner.

The scope of the invention is defined in the appended claims, and practical embodiments thereof will now be particularly described with reference to the drawings accompanying the Provisional Specification in which:

Figure 1 is a fragmentary elevation of a vessel having a first form of closure device as seen when looking towards the hinge of the closure device;

Figure 2 is a side view of Figure 1 with the lid fully open;

Figure 3 is a part-sectional elevation similar to Figure 1 of a modification;

and the drawings accompanying the Complete

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Specification in which

Figure 4 is a view similar to Figure 3 of another embodiment;

5 Figure 5 is an underplan view of the device of Figure 4;

Figure 6 is a view similar to Figure 3 of a further alternative embodiment;

Figure 7 is an underplan view of the construction of Figure 6;

10 Figure 8 is a fragmentary section of the embodiment 4 and 5 with the lid open;

Figures 9 to 13 are fragmentary sectional elevations showing alternative forms of tear strip, and

15 Figure 14 is a sectional elevation of a still further embodiment.

Referring first to Figures 1 and 2, the closure device illustrated therein includes a cover or lid portion 48 formed integrally with a skirt portion 40, the lid 48 extending across and closing the mouth of the vessel or container 61 while the skirt portion 40 resiliently embraces the neck or wall thereof. The entire closure device is made of a single sheet of plastic material, and the skirt 40 has a relatively narrow thickened zone 41 extending thereacross to form a stiffened lug which projects at its bottom end 42 below the lower peripheral edge 43 of the skirt. This lug constitutes a hinge for the lid. A tear strip consisting of a wire 44 is embedded peripherally in the skirt portion 40 between the free edge 43 thereof and the lid 48 during moulding of the closure device, the wire 44 extending nearly completely around the skirt portion 40 from one side of the hinge lug 41 to the opposite side thereof and terminating, at the right side of the hinge 41 as seen in Figure 1, in a tab 45 so as to facilitate removal of the tear strip 44.

After the closure device is moulded it is applied to the container or vessel 61 either by being stretched cold onto the latter so as to resiliently grip the same, or by being placed, after heating, over the vessel neck so as to shrink thereon during cooling. When it is desired to open the vessel, the tab 45 is gripped and the tear strip 44 is removed so as to divide the skirt portion 40 peripherally into an upper part 47 and lower part 46 which are then interconnected solely by the hinge lug 41. The lower skirt part 46 forms an elastic anchoring band which grips the vessel 61 while the upper skirt part 47 forms a peripheral wall or flange integral with the lid 48, and resiliently embraces the vessel mouth. In order to open the lid its integral skirt portion 47 is lifted at a point opposite the hinge lug 41 and swung to the open position shown in Figure 2. In this position, the stiffened lug 41 is inverted, thereby twisting the band 46 and constituting an over-centre device to hold the lid open. The band 46, however, retains the open cover 48 on the vessel. To close the lid, the cover 48 is hinged back about the lug

41 and the integral wall 47 passed down over the rim of the vessel mouth, the band 46 resuming its initial flat form. The projecting end portion 42 of the stiffened lug 41 forms an abutment means engaging the vessel or container 61 to releasably maintain the lid in its open position as is shown in Figure 2.

In the modification shown in Figure 3, the flat lid or cover 48 of Figures 1 and 2 is replaced by a plug or bung-like formation 49 which is a snug fit within the vessel mouth. A lip 50 is formed integral with the wall 47 opposite the hinge lug 41 and above the tear strip or wire 44 to facilitate lifting of the plug 49.

As shown in Figure 10, the tear strip 44 is in the form of a wire embedded within the plastic material of the skirt 40, and covered only by a light thickness of the plastic material, the cross section of the plastic material which lies on either side of the wire being very thin where it is joined to the skirt portion 47 and the anchoring band 46, respectively. Thus, when the wire is torn from the closure device it is removed with its covering of plastic material.

In the embodiment of the invention which is illustrated in Figures 4 and 5, the hinge 51 interconnects the upper skirt portion 47 with the anchoring band 46 the latter being in the form of a relatively thick annular member, and this hinge portion 51 is not thicker than the adjoining parts of the skirt 40 and does not project beyond the bottom edge 43 thereof. Between the upper skirt portion 47 and the band portion 46 is a tear strip in the form of a peripheral rib 44 which is united to the upper and lower skirt portions 47 and 46, respectively, by weakened portions of the material of reduced thickness so that the tear strip 44 can easily be torn from the device, this tear strip terminating at one side of the hinge 51 in a tab 45 which is capable of being gripped by the user. The tear strip 44 extends almost completely around the closure device but terminates short of the hinge 51 so as to define with the latter a pair of small openings 52.

The hinge portion 51 is relatively thin and thus is flexible enough to provide the desired hinge action. Because of the flexibility of the plastic material there is no danger of rapid wear of the hinge with resulting breakage thereof, as is the case with metal.

The bottom edge of the upper skirt portion 47 is flanged at 53 to facilitate mechanical mounting of the closure device on a vessel or container such as a preserve jar. At a point diametrically opposite to the hinge 51, the flange 53 is enlarged to provide an integral lifting tab 50 to facilitate opening of the lid.

The lid 48 has an annular plug portion 54 moulded integrally and simultaneously therewith. This plug 54 is thickest at its root 55, the outer surface 57 forming part of an in-

5 verted cone to aid entry of the plug 54 into the mouth of the container. Furthermore, an annular rib 56 on the outer surface of the plug 54 is adapted to form a seal between the plug and the container. The annular plug 54 defines with the skirt portion 40 an annular groove 58 which receives the mouth of the container, and the size of the groove 58 is designed to match properly with the diameter and thickness of the wall of the container.

10 Figure 8 shows the lid structure of Figures 4 and 5 opened after the tear strip has been removed. The plug 54 engages the rim 62 of the container 61 so as to form an abutment which releasably maintains the lid in the open position.

15 Figures 6 and 7 show a modified closure device which is adapted to be used for bottles, for example.

20 As in Figures 4 and 5, a closure plug 54 enters the neck of the bottle or like vessel so as to seal the latter, and defines with the skirt 40 an annular groove adapted to receive the bottle mouth. The plug portion 54 does not extend down to the level of the rib 53, and terminates at its bottom end in an external sealing rib 56. Moreover, the skirt 40 is provided with an internal annular shoulder 59 formed by an internal annular rib 60 which also engages the bottle rim so as to seal the latter when the lid 48 is closed.

30 When the closure device of Figures 6 and 7 is in an open position similar to that shown in Figure 8, the plug 54 will also engage the rim of the bottle mouth so as to maintain the lid 48 releasably in its open position, although the plug 54 may not stand upright, as shown in Figure 8, but may be inclined. It will not, however, in any way interfere with the pouring of the contents of the bottle or like vessel.

40 Figure 9 shows a closure device similar to that of Figure 1 where a wire 13a is embedded in the skirt portion of the closure device between the upper or flange part 11a, which is integral with the lid or cover 10a and the lower part 12a. The wire 13a has a part of its inner peripheral surface exposed at the interior of the closure device, and a free end of the wire projects externally on one side of the hinge, the other end of the wire terminating on the opposite side of the hinge. Thus, when the user tears the wire 13a from the device it will tear through the plastic so as to partially separate the upper and lower skirt portions 11a and 12a respectively from each other.

55 In Figure 11, the closure device has a skirt of uniform thickness. This skirt has an upper or flange part 11b and a lower anchoring band part 12b. The closure device is formed during moulding with two rows of perforations 13b which constitute a pair of peripheral weakened portions corresponding to the weakened portions of the embodiments described above.

65 Thus, the rows of perforations 13b define be-

tween them a tear strip 14b and this tear strip is formed with an integral tab to facilitate removal of the tear strip. As before the two rows of perforations 13b terminate on opposite sides of a hinge which is simply formed by a portion of the skirt extending between and integral with the portions 11b and 12b thereof.

70 The embodiment of Figure 12 is identical with that of Figure 11 and has the corresponding parts indicated by the same numerals but having the suffix c. With this embodiment the only difference is that the wall portion of the skirt between the parts 11c and 12c thereof is of reduced thickness, this wall portion being located between the two rows of perforations 13c. Thus, with this embodiment the tear strip is thinner than with the embodiment of Figure 11.

75 Figure 13 fragmentarily illustrates a closure device identical with that of Figure 4 except that it is not provided with an inner plug, and the tear strip 44 has a wire 55 embedded in its interior to lend rigidity thereto.

80 Figure 14 of the drawings shows a closure on the neck of a bottle 70. This closure is identical with that of Figure 6 except that it has a wide anchoring band 71 at its bottom end rather than the ring 46 of Figure 6 which is of circular cross section. The closure is shown in Figure 14 after the tear strip has been removed. The rim of the bottle mouth is defined by a bead 72, the outer diameter of which is greater than the inner diameter of the lip 59 on the lid when this lip is unstressed. The bottle 70 remains tightly sealed even after the tear strip is removed. When the lid is opened the plug 54 engages the rim of the bottle 70 and holds the lid open against the resilience of the material of the hinge 74, which is identical with the hinge 44.

85 When the user recloses the lid, the lip 59 snaps over the bead 72 and the bottle 70 is again sealed in a fluid-tight manner.

90 Thus, with a closure device according to the present invention, a vessel or container is sealed even after the tear strip is removed and until the lid is opened. The vessel is again sealed when the lid is reclosed, whilst the latter is always retained on the vessel by the anchoring band.

#### WHAT I CLAIM IS:—

1. A closure device for a vessel mouth comprising a lid or cover having a peripheral skirt adapted to embrace and grip the neck of the vessel, or that part of the vessel wall immediately adjacent the mouth thereof, and means for separating the skirt peripherally, except over a relatively narrow interconnecting zone which constitutes a hinge for the lid or cover, into upper and lower annular parts, the upper part forming part of the lid or cover and the lower part constituting an anchoring band which remains in place on the vessel during opening and closing of the lid or cover.

2. A closure device according to Claim 1 wherein the lid or cover has an abutment formation adapted to cooperate with the vessel so as to releasably retain the lid or cover in the open position. 35
3. A closure device according to Claim 2 wherein the interconnecting zone is stiffened—as by a local thickening of the skirt—and extends across the full width of the skirt to project below the free bottom edge thereof and constitute the abutment. 40
4. A closure device according to Claim 1, 2 or 3 wherein the lid or cover has an inwardly directed plug adapted to enter and seal against the internal wall of the vessel mouth. 45
5. A closure device according to Claims 2 and 4 wherein a part of the periphery of the plug adjacent the hinge constitutes the abutment. 50
6. A closure device according to Claim 4 or 5 wherein the peripheral surface of the plug is of generally conical form to facilitate its introduction into the mouth of the vessel. 55
7. A closure device according to Claim 4, 5 or 6 wherein the plug has an external peripheral rib adapted to make sealing contact with the internal wall of the vessel mouth.
8. A closure device according to any of Claims 4 to 7 wherein the skirt has an internal lip adapted to snap over a corresponding bead around the vessel mouth.
9. A closure according to any preceding claim wherein the skirt separating means comprises a peripheral tear strip formed in the material of the skirt and extending almost completely therearound, except for the interconnecting zone.
10. A closure device according to Claim 9 wherein the tear strip comprises a length of wire or like material embedded into the skirt.
11. A closure skirt device according to Claim 10 wherein the material of the skirt on either side of the wire or the like is weakened to improve the separating action when the tear strip is pulled away.
12. A closure device according to Claim 9 wherein the tear strip is constituted by a peripheral portion of the skirt which is bounded on opposite sides by rows of perforations.
13. A closure device according to any preceding claim wherein the lower edge of the skirt is reinforced, as by a bead or flange.
14. A closure device according to any preceding claim wherein the skirt is peripherally reinforced—as by a bead or flange—above the line of separation thereof.
15. A closure device substantially as hereinbefore particularly described with reference to the accompanying drawings.

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#### PROVISIONAL SPECIFICATION

#### Improvements in Lids for Vessel Mouths

- I, PAUL STEDLITZ VAN BAARN, a citizen of the United States of America, of Hotel Lutetia, 43, Boulevard Raspail, Paris, France, do hereby declare this invention to be described in the following statement:—
- This invention relates to lids for closing the mouths of vessels—for example, bottles and jars—and has for an object to provide a simple and efficient construction whereby the lid is initially secured in place by a breakable seal, but after the seal has been broken, is retained on the vessel in the manner of a hinged lid which can be replaced after some of the contents have been removed so as to reclose the vessel in at least substantially airtight fashion.
- According to the present invention, a lid for the mouth of a vessel comprises a cover having an integral skirt portion adapted to embrace and grip the neck of the vessel, or the wall of the vessel immediately adjacent the rim of the mouth, and having a depending stiff or rigid lug, constituting a hinge, secured on the skirt for the full depth thereof and extending slightly below the lower edge of the skirt, and means for separating the skirt, except over the zone occupied by the lug, along a peripheral line located between the cover and the lower edge of the skirt, the skirt being relatively shallow wall around the cover and a lower band around the vessel neck or wall.
- Preferably, the lid and skirt are moulded integrally in a synthetic resin plastic material, whilst the separating means advantageously comprises a tear strip constituting a breakable seal and defined by a wire or the like moulded into the plastic material, or by a pair of closely spaced weakened or perforated lines.
- The cover may have an integral plug-like portion adapted to be a snug fit within the mouth of the vessel, and may further be provided with an external lip opposite the lug to aid in lifting the cover. The cover may have a seating washer on its underside to engage the rim of the vessel mouth when the lid is closed.
- Preferred embodiments of the invention will now be particularly described, by way of illustration only, with reference to the accompanying drawings in which:
- Figure 1 is a fragmentary elevation of a jar having a lid according to the invention mounted thereon, the view being taken looking toward the hinge lug;
- Figure 2 is a fragmentary elevation seen from the left of Figure 1 and showing the cover lifted right back, and
- Figure 3 is a fragmentary part-sectional

Referring first to Figures 1 and 2, the lid is moulded in a synthetic resin plastic material and comprises a skirt 40 which embraces the vessel wall immediately adjacent the rim of the mouth thereof and grips it by virtue of its inherent resilience or plasticity. A vertical lug 41, constituted by a local thickening of the skirt, extends for the full depth thereof, and projects at 42 slightly below the lower edge of the skirt, as seen in Figure 1. The extra thickness of the lug may impart the necessary stiffness thereto, for the purpose described below, or it may be reinforced by a rigid insert moulded thereinto.

A wire 44 is moulded into the skirt 40 during manufacture of the lid and extends around the skirt, except over the zone occupied by the lug 41, in a peripheral line at a level between the lower edge 43 of the skirt and a flat top or cover 48. A tag 45 secured to one end of the wire 44 adjacent the lug 41 provides a finger grip for pulling the wire, which thus defines a tear strip or breakable seal. Thus, when the contents of the jar or bottle or like vessel are to be extracted, the wire 44 is pulled, thereby separating the skirt 40 into a band 46 and a relatively shallow wall 47 integral with the flat cover 48, the wall and the band being then united only by the lug 41.

On pulling up the cover 40 at a point opposite the lug 41, the cover hinges on the lug until the latter is substantially inverted (see Figure 2), thereby twisting the band 46 and constituting an over-centre device to hold the lid open. The band 46, however, retains the open cover 48 on the vessel. To close the lid, the cover 48 is hinged back about the lug 41 and the integral wall 47 pressed down over the rim of the vessel mouth, the band 46 re-

suming its initial flat form.

In the modification shown in Figure 3, the cover 48 of Figures 1 and 2 is replaced by a plug or bung-like formation 49 which is a snug fit within the vessel mouth. A lip 50 is formed integral with the wall 47 opposite the lug 41 and above the tear strip or wire 44 to facilitate lifting of the plug 49.

Alternatively, the plug formation 49 may supplement the flat top or cover 48 of Figures 1 and 2, and may be solid or hollow.

Instead of a wire 44, a metal or fabric strip may be moulded into the skirt 40 to provide a tear strip. Alternatively, a narrow belt of the plastic material may be formed of reduced thickness around the skirt so as to be separable therefrom by tearing; or two lines of weakening or perforation may be used to define the tear strip. The flat top or cover 48 or the plug formation 49 may be reinforced with metal or fabric inserts.

The whole lid assembly may be moulded with the internal skirt diameter slightly under the external diameter or the neck or wall of the vessel adjacent the rim of the mouth and the skirt 40 may then be stretched elastically thereover, or it may be applied to the vessel under heat to render the skirt 40 plastic and adhesive to the vessel wall. The lid may be of circular or non-circular shape to suit the configuration of the mouth of the vessel, and may have an internal washer to facilitate re-sealing of the vessel on re-closure of the lid.

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Fig.1.

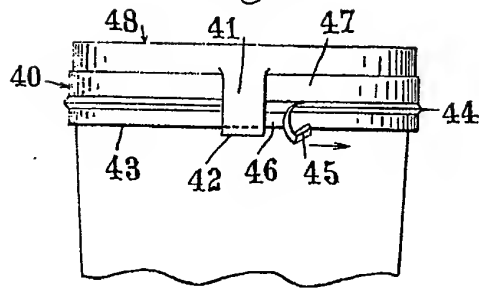


Fig. 2.

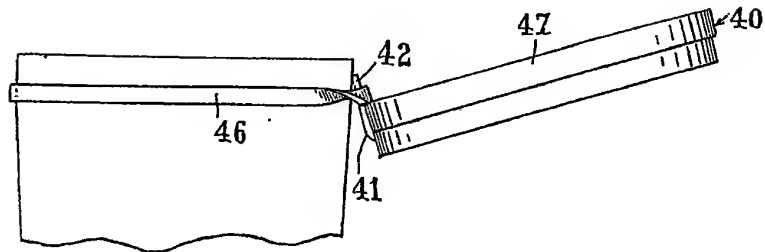
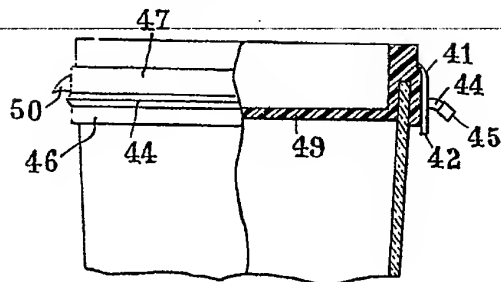
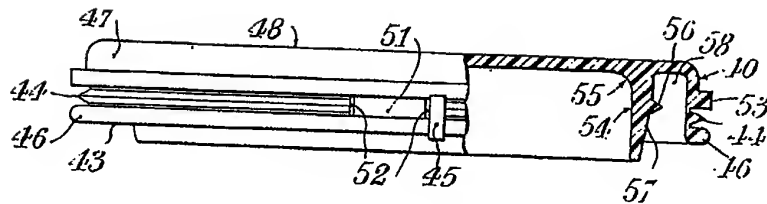


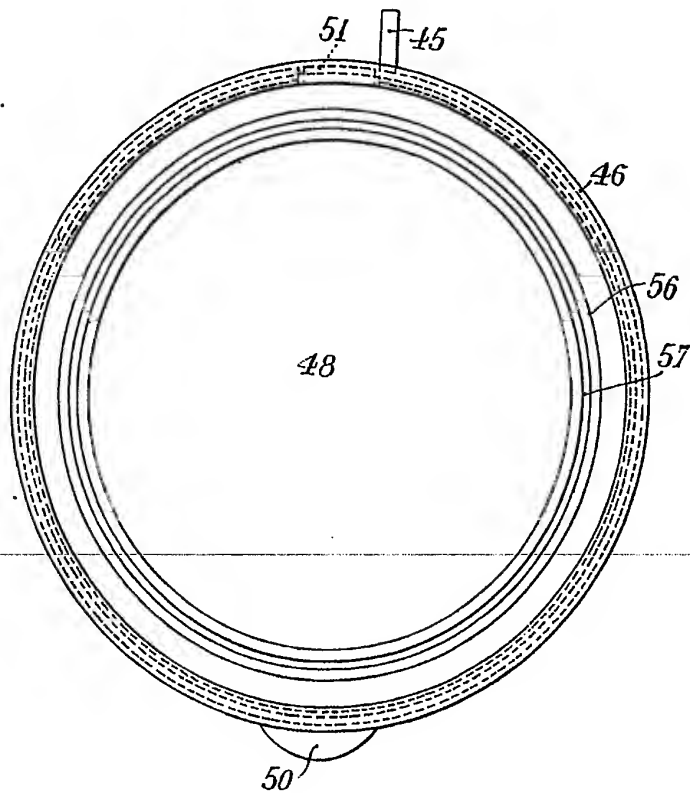
Fig. 3.

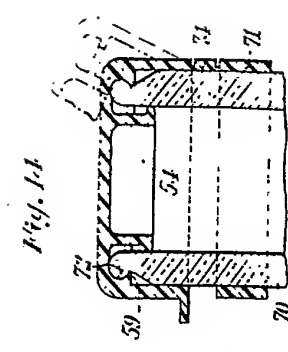
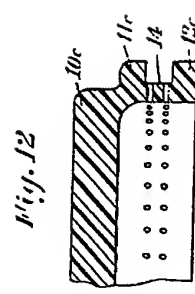
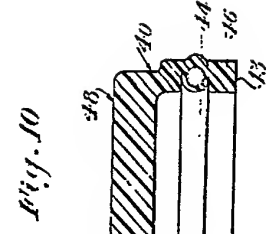
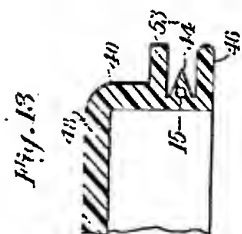
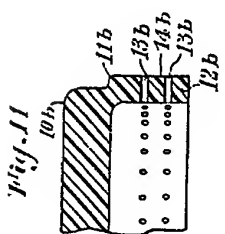
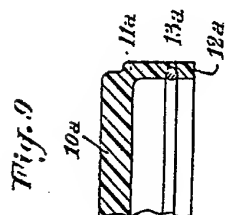
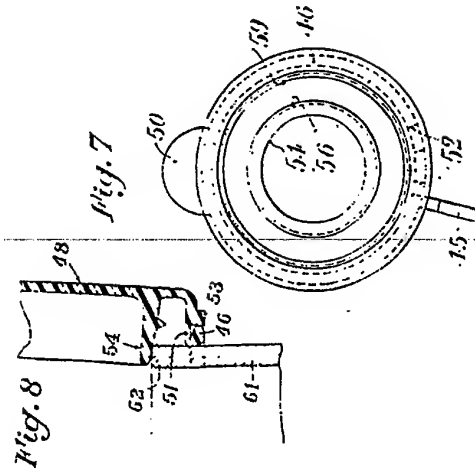
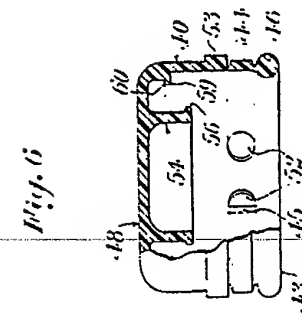


*Fig. 4*



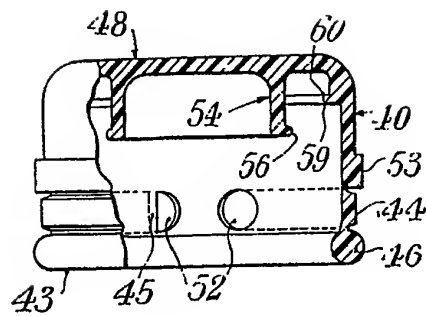
*Fig. 5*



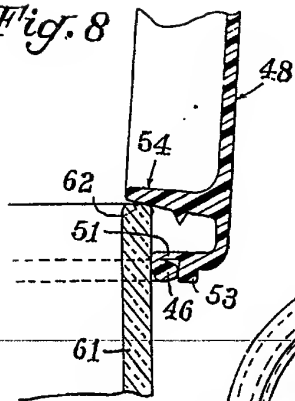




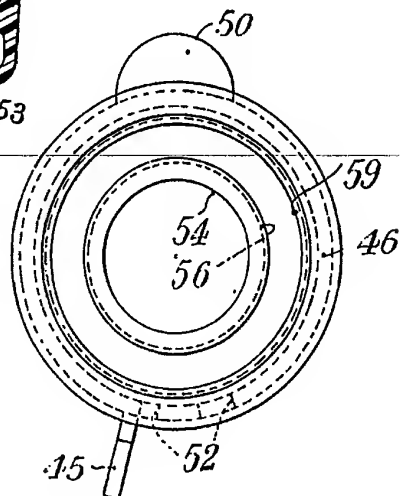
*Fig. 6*



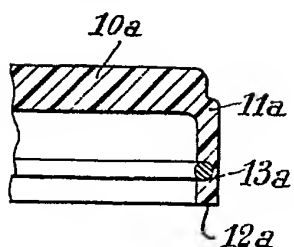
*Fig. 8*



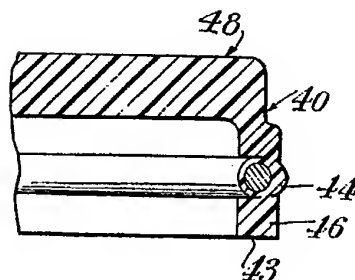
*Fig. 7*



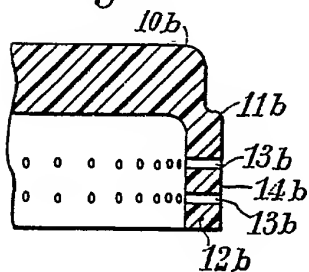
*Fig. 9*



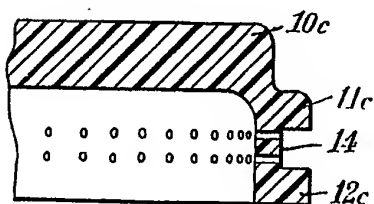
*Fig. 10*



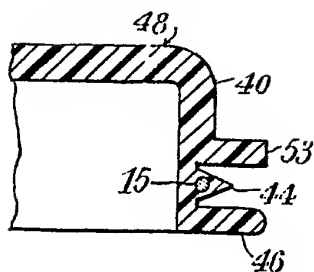
*Fig. 11*



*Fig. 12*



*Fig. 13*



*Fig. 14*

